Log No. 103 Rev 7/15/21, TAG Revision 7/16/21, Proponent revision 7/21/21, TAG Revision 7/23/21, Proponent Revision 7/29/21 and 8/19/21

Final version 8/27/21

Washington State Energy Code Development

Standard Energy Code Proposal Form

Code being amended: ☒Commercial Provisions ☐Residential Provisions

Code Section # __C403.1.4, C407, C503.4.1, C503.4.6____

Brief Description: Provide heat pump space heating, rather than fossil fuel or electric space heating, for all buildings. Exceptions are provided to allow electric resistance heating for small loads and as supplementary heat for very cold weather.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

C403.1.4 Use of electric resistance and fossil fuel-fired HVAC heating equipment. HVAC heating energy shall not be provided by electric resistance or fossil fuel combustion appliances. For the purposes of this section, electric resistance HVAC heating appliances include but are not limited to electric baseboard, electric resistance fan coil and VAV electric resistance terminal reheat units and electric resistance boilers. For the purposes of this section, fossil fuel combustion HVAC heating appliances include but are not limited to appliances burning natural gas, heating oil, propane, or other fossil fuels.

Exceptions.

1. **Low heating capacity.** Buildings or areas of buildings, other than *dwelling unit*s or sleeping units, that meet the interior temperature requirements of IBC Chapter 12 with a total installed HVAC heating capacity no greater than 8.5 BTU/h (2.5 watts) per square foot of *conditioned space* are permitted to be heated using electric resistance appliances. For the purposes of this exception, overhead or wall-mounted radiant heating panels installed in an unheated or semi-heated space, insulated in compliance with Section C402.2.8 and controlled by occupant sensing devices in compliance with Section C403.11.1 need not be included as part of the HVAC heating energy calculation.

2. **Dwelling and sleeping units.** Dwelling or sleeping units having an installed HVAC heating capacity no greater than 750 watts in Climate Zone 4, and 1000 watts in Climate Zone 5, in any separate habitable room with exterior fenestration are permitted to be heated using electric resistance appliances. For buildings in locations with exterior design conditions below 4°F, an additional 250 watts above that allowed for Climate Zone 5 is permitted.

2a. Corner rooms. A room within a dwelling or sleeping unit that has two primary walls facing different cardinal directions, each with exterior fenestration, is permitted to have an installed HVAC heating capacity no greater than 1000 watts in Climate Zone 4, and 1300 watts in Climate Zone 5. Bay windows and other minor offsets are not considered primary walls. For buildings in locations with

exterior design conditions below 4°F,an additional 250 watts above that allowed for Climate Zone 5 is permitted.

3. **Small buildings.** Buildings with less than 2,500 square feet of *conditioned floor area* are permitted to be heated using electric resistance appliances.

4. **Defrost**. Heat pumps are permitted to utilize electric resistance as the first stage of heating when a heat pump defrost cycle is required and is in operation.

5. **Air-to-air heat pumps.** Buildings are permitted to utilize internal electric resistance heaters to supplement heat pump heating for air-to-air heat pumps that meet all of the following conditions:

   a. Internal electric resistance heaters have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery.
   b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower.
   c. The heat pump complies with one of the following:
      1. Controlled by a digital or electronic thermostat designed for heat pump use that energizes the supplemental heat only when the heat pump has insufficient capacity to maintain set point or to warm up the space at a sufficient rate,
      2. Controlled by a multistage space thermostat and an outdoor air thermostat wired to energize supplemental heat only on the last stage of the space thermostat and when outdoor air temperature is less than 32°F.
      3. The minimum efficiency of the heat pump is regulated by NAECA, its rating meets the requirements shown in Table C403.3.2(2), and its rating includes all usage of internal electric resistance heating.
   d. The heat pump rated heating capacity is sized to meet the heating load at an outdoor air temperature of 32°F or lower and has a rated heating capacity at 47°F no less than 2 times greater than supplemental internal electric resistance heating capacity in Climate Zone 4 and no less than the supplemental internal electric resistance heating capacity in Climate Zone 5, or utilizes the smallest available factory-available internal electric resistance heater.

6. **Air-to-water heat pumps~~, up to 2,000 MBH~~.** Buildings are permitted to utilize electric resistance (for climate Zone 4 or 5) or fossil fuel-fired (for climate Zone 5) auxiliary heating to supplement heat pump heating for hydronic heating systems ~~that have air-to-water heat pump heating capacity no greater than 2000kBTU/hr at 47°F, and~~ that meet all of the following conditions:

   ~~a.~~ Controls for the auxiliary electric resistance or fossil fuel-fired heating are configured to lock out the supplemental heat when the outside air temperature is above 3~~6~~2°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
   ~~b.~~ The heat pump controls are configured to use the compressor as the first stage of heating down to the lowest exterior design temperature for which

the equipment is rated ~~an outdoor air temperature of 17°F or lower~~ except during startup or defrost operation.

~~c.~~ The heat pump rated heating capacity at 47°F is no less than 75~~80~~% ofthe design heating load at 29°F.

~~**7. Air-to-water heat pumps, up to 3,000 MBH.** Buildings are permitted to utilize~~electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 2000 KBTU/hr and no greater than 3000 kBTU/hr at47°F, and that meet all of the following conditions:

~~d. Controls for the auxiliary electric resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 36°F, unless the hot water supply temperature setpoint to the building heatcoils cannot be maintained for 20 minutes.~~

~~e. The heat pump controls are configured to use the compressor as the firststage of heating down to the lowest exterior design temperature for whichthe equipment is rated an outdoor air temperature of 17°F or lower down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.~~

~~f. The heat pump rated heating capacity at 47°F is no less than 75% of thedesign heating load at 29°F.~~

~~**8. Air-to-water heat pumps, over 3,000 MBH.** Buildings are permitted to utilize~~electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacitygreater than 3000 kBTU/hr at 47°F and that meet all of the following conditions:

~~g. Controls for the auxiliary resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 40°F unlessthe hot water supply temperature setpoint to the building heat coils cannotbe maintained for 20 minutes.~~

~~h. The heat pump controls are configured to use the compressor as the first stage of heating down to down to the lowest exterior design temperature for which the equipment is rated an outdoor air temperature of 17°F or lower an outdoor air temperature of 17°F or lower except during startup ordefrost operation.~~

~~c. The heat pump rated heating capacity at 47°F is no less than 70%of the design heating load at 29°F.~~

~~9~~7. **Ground source heat pumps**. Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems with ground source heat pump equipment that meets all of the following conditions:

a. Controls for the auxiliary resistance heating are configured to lock out the supplemental heat when the equipment source-side entering water temperature is above 42~~outdoor air temperature is above 32~~°F, unless the hot water supply

temperature setpoint to the building heat coils cannot be maintained for 20 minutes.

b. The heat pump controls are configured to use the compressor as the first stage of heating.

~~The heat pump rated heating capacity shall be sized to meet 100% of the design heating load at the rating condition of the applicable equipment type per Table C403.3.2(14). at 32°F entering water conditions is no less than 70% of the design heating load.~~

The ground source heat exchanger shall be sized so that the heat pump annual heating output is no less than 70% of the total annual heating output in the final year ~~over the course~~ of a 30-year simulation using IGSHPA ~~approved~~ listed simulation software.

~~10~~8. **Small systems.** Buildings in which electric resistance or fossil fuel appliances, including decorative appliances, either provide less than 5 percent of the total building HVAC system heating capacity or serve less than 5 percent of the *conditioned floor area*.

~~11~~9. **Specific conditions.** Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions *approved* by the *code official* for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.

~~12~~10. **Kitchen ~~exhaust~~make-up air.** Make-up air for commercial kitchen exhaust systems required to be tempered by Section 508.1.1 of the International Mechanical Code is permitted to be heated by using fossil fuel in Climate Zone 5 or ~~using~~ electric resistance ~~appliances~~ in Climate Zone 4 or 5.

~~13~~11. **District energy.** Steam or hot water district energy systems that utilize fossil fuels as their primary source of heat energy, that serve multiple buildings, and that were already in existence prior to the effective date of this code, including more energy-efficient upgrades to such existing systems, are permitted to serve as the primary heating energy source.

~~14~~12. **Heat tape.** Heat tape is permitted where it protects water-filled equipment and piping located outside of the *building thermal envelope*, provided that it is configured and controlled to be automatically turned off when the outside air temperature is above 40°F.

~~15~~13. **Temporary systems.** Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than 40°F.

~~16. **Emergency generators.** Emergency generators are permitted to use fossilfuels.~~

1714. **Pasteurization.** Electric resistance heat controls are permitted to reset the supply water temperature of hydronic heating systems that serve service water heating heat exchangers during pasteurization cycles of the service hot water storage volume. The hydronic heating system supply water temperature shall be configured to be 145°F or lower during the pasteurization cycle.

157. **Freeze Protection.** Heating systems sized for spaces with indoor design conditions of 45°F or lower and intended for freeze protection are permitted to use electric resistance. The building envelope of any such space shall be insulated in compliance with Section C402.1. ~~Spaces sized for indoor design conditions of 45°F or lower, intended for freeze protection, and insulated as conditioned are permitted to use electric resistance heating.~~

16. **DOAS ERV Auxiliary Heat.** Dedicated outdoor air system with energy recovery ventilation are permitted to utilize fossil fuel ~~-fired~~ for Climate Zone 5 or electric resistance in Climate Zones 4 or 5 for auxiliary heating to preheat outdoor air for defrost or as auxiliary supplemental heat to temper supply air to 55 °F or lower for buildings or portions of buildings that do not have hydronic heating systems.

Table C407.2
MANDATORY COMPLIANCE MEASURES FOR
TOTAL BUILDING PERFORMANCE METHOD

Section	Title	Comments
	Envelope	
C402.5	Air Leakage	
	Mechanical	
C403.1.2	Calculation of heating and cooling loads	
C403.1.3	Data centers	
C403.1.4	Use of electric resistance and fossil fuel-fired HVAC heating equipment	
C403.2	System design	
C403.3.1	Equipment and system sizing	
C403.3.2	HVAC equipment performance requirements	
C403.3.6	Ventilation for Group R occupancy	
C403.4	HVAC system controls	

C403.4.1	Thermostatic controls	Except for C403.4.1.4
C403.4.2	Off-hour controls	Except for Group R
C403.4.7	Combustion heating equipment controls	
C403.4.8	Group R-1 hotel/motel guestrooms	See Section C403.7.4
C403.4.9	Group R-2 and R-3 dwelling units	
C403.4.10	Group R-2 sleeping units	
C403.4.11	Direct digital control systems,	
C403.5.5	Economizer fault detection and diagnostics (FDD)	
C403.7	Ventilation and exhaust systems	Except for C403.7.6
C403.8	Fan and fan controls	
C403.9.1.1	Variable flow controls	For cooling tower fans ≥ 7.5 hp
C403.9.1.2	Limitation on centrifugal fan cooling towers	For open cooling towers
C403.10	Construction of HVAC elements	
C403.11	Mechanical systems located outside of the building thermal envelope	
Service Water Heating		
C404	Service Water Heating	
Lighting and Electrical		
C405.1	General	
C405.2	Lighting controls	
C405.3	Exit signs	
C405.4	Interior lighting power	
C405.5	Exterior building lighting power	
C405.6	Electrical transformers	
C405.7	Dwelling unit energy consumption	
C405.8	Electric motor efficiency	
C405.9	Vertical and horizontal transportation	
C405.10	Controlled receptacles	

C405.11	Voltage drop in feeders	
Other Requirements		
C407	Total Building Performance	
C408	System commissioning	
C409	Energy metering	
C410	Refrigeration requirements	
C411	Solar readiness	

C503.4.1 New mechanical systems. All new mechanical systems in existing buildings, including packaged unitary equipment and packaged split systems shall comply with Section C403, except as noted in the subsections below.

- **C503.4.6 New and Replacement HVAC heating system equipment.** Where building HVAC mechanical heating equipment is added or replaced, the new equipment shall comply with Section C403.1.4 if one or more of the following project conditions exist: An existing heat pump is replaced, or new heating capacity is added to an existing system.
- An existing fossil fuel-fired or electric resistance unit with DX cooling is replaced, or new heating capacity is added to an existing system.
- A fossil fuel-fired furnace or electric resistance unit is replaced, and cooling is added to the same previously uncooled space
- A fossil fuel-fired or electric resistance boiler is replaced. If exception 6, 7, 8, or 9 of C403.1.4 is used and an electric service upgrade would be required, gas auxiliary heat in lieu of electric resistance auxiliary heat is permissible for any climate zone. The auxiliary heat can be used at the outdoor air temperature required by the load.

Exceptions:

- Where only one heating appliance is failing and is replaced by another having the same or lesser heating capacity and the same or higher efficiency, C403.1.4 does not apply. This exception cannot be used within the same building more than once in a 24-month period.
- Code officials have discretion to grant additional exceptions based on space impracticality.

If the alteration does not meet one of the above conditions yet opts to comply with C403.1.4, the project is exempt from all requirements of C406.

~~**C503.4.6.1 Added or Replaced Heating Hydronic Equipment.** Any added or replaced heating hydronic equipment shall be designed with a supply water temperature of 120F or less.~~

C503.4 Mechanical systems. Those parts of systems which are altered or replaced shall comply with Section C403 unless ~~a requirement is~~ specifically exempted ~~in Section C503.4.2, C503.4.5 or C503.4.6~~ in this section. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

Exceptions:

1. Existing mechanical systems ~~which are altered or where parts of the system are altered or replaced are not required to be modified to comply with Section C403.3.5 as long as provided~~ are not required to be modified to comply with Section C403.3.5 where mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the alteration.
2. ~~Existing mechanical systems where parts of the system are altered or replaced are not required to be modified to comply with Section C403.1.4 provided the alteration does not increase heating system capacity or include replacement of a heating appliance~~ Compliance with Section C403.1.4 is not required where the alteration does not include replacement of a heating appliance.
3. Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts make full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through C403.3.2(~~12~~6).
4. Only those components of existing HVAC systems that are altered or replaced shall be required to meet the requirements of Section C403.8.1~~,~~ Allowable fan motor horsepower. Components replaced or altered shall not exceed the fan power limitation pressure drop adjustment values in Table C403.8.1(2) at design conditions. Section C403.8.1 does not require the removal and replacement of existing system ductwork.

C503.4.1 New mechanical systems. All new mechanical systems and equipment in existing buildings, ~~including packaged unitary equipment and packaged split systems,~~ shall comply with Sections C403 and C408.

C503.4.2 Addition of cooling capacity. Where mechanical cooling is added to a space that was not previously cooled, the mechanical system shall comply with either Section C403.3.5 or C403.5.

Exceptions:

1. Qualifying small equipment.
2. Chilled water terminal units connected to systems with chilled water generation equipment with OPLV values more than 25 higher than minimum part load efficiency listed in Table C403.3.2(7).

C503.4.3 Alterations or replacement of existing cooling systems. Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total economizer capacity unless the system complies with either Section C403.3.5 or C403.5.

System alterations or replacement shall comply with Table C503.4.3 when the individual cooling unit capacity and the building total capacity of all cooling equipment without economizer do not comply with Sections C403.3.5 or C403.5. Equipment replacements that include space heating shall also comply with Section C503.4.6.

TABLE C503.4.3
ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL ALTERATIONS

C503.4.4 Controls for cooling equipment replacement. When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, and Section C403.5.1. for integrated economizer control.

~~**C503.4.5 Addition of heating capacity.** Where a new mechanical heating appliance or system is added that increases the building heating capacity, the appliance or system shall comply with C403.1.4.~~

~~**Exceptions:**~~

1. ~~New hydronic coils that are served by existing unaltered hydronic heating systems and equipment.~~
2. ~~New electric resistance heating coils in variable air volume (VAV) terminal units or fan coil terminal units, that are added to the distribution system and are served by an unaltered central air handling system.~~
3. ~~New terminal water source heat pumps that are served by existing unaltered heating systems and equipment.~~

C503.4.5 ~~Cooling~~ Mechanical equipment relocation. Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

~~**C503.4.6 Replacement of existing heating appliances.** Where a mechanical heating appliance is replaced with a unit with equal or smaller heating output capacity, the replacement appliance shall comply with C403.1.4 or with an alternate compliance option in Table C503.4.6.~~

~~**Exceptions:**~~

- ~~Replacement hydronic coils that are served by existing unaltered hydronic heating systems and equipment.~~
- ~~Replacement electric resistance heating coils in variable air volume (VAV) terminal units or fan coil terminal units, that are served by an unaltered central air handling system.~~
- ~~Replacement terminal water source heat pumps that are served by existing unaltered heating systems and equipment.~~
- ~~Air handling equipment designed for 100% outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to C403.3.5.~~
- ~~Air handling equipment with a heating output capacity less than 225,000 Btu/h with existing mixed air entering temperature less than 60F.~~
- ~~Where compliance with C403.1.4 would trigger an unplanned utility electrical service upgrade based upon the NEC 220.87 method for determining existing loads.~~

- ~~Where the building is served by multiple heating appliances of the same type and only one appliance requires replacement. This exception cannot be used for boilers or for multiple successive mechanical alteration permit applications.~~

C503.4.6 Addition or replacement of heating appliances. Where a mechanical heating appliance is added or replaced, the added or replaced appliance shall comply with C403.1.4 or with an alternate compliance option in Table C503.4.6.

Exceptions:

1. Terminal unit equipment, including but not limited to, hydronic VAV boxes, electric resistance VAV boxes, electric duct heaters, water source heat pumps, fan coils, or VRF indoor units that are served by an unaltered central system.
2. Air handling equipment with hydronic coils.
3. Air handling equipment designed for 100% outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to C403.3.5.
4. Replacement of existing oil-fired boilers.
5. Replacement of existing steam boilers with steam distribution to terminal units and the associated boiler feed equipment.
6. Where compliance with C403.1.4 would trigger an unplanned utility electrical service upgrade based upon the NEC 220.87 method for determining existing loads.
7. Like-for-like replacement of a single heating appliance is permitted where that appliance is failing, requires immediate replacement, and where no other HVAC work is planned.

TABLE C503.4.6
COMPLIANCE OPTIONS FOR MECHANICAL HEATING EQUIPMENT ~~REPLACEMENT~~ ALTERATIONS

	~~Replacement Equipment Type[a]~~	~~Efficiency Table Reference~~	~~Alternate Compliance Options to Section C403.1.4~~
~~1~~	~~Single packaged equipment~~	~~Table C403.3.2(4)~~	~~1) Packaged heat pump controls are configured in accordance with Section C403.1.4 Exception 5b down to an outdoor air temperature of 32°F or lower. [note to reviewer: request consensus on temp]~~
~~2~~	~~Unitary equipment~~	~~Tables C403.3.2(1) and C403.3.2(2)~~	~~1) Heat pump controls are configured in accordance with Section C403.1.4 Exception 5b down to an outdoor air temperature of 32°F or lower. [note to reviewer: request consensus on temp]~~
~~3~~	~~Water-source heat pump~~	~~Table C403.3.2(14)~~	~~NA~~
~~4~~	~~Variable refrigerant flow equipment~~	~~Table C403.3.2(9)~~	~~NA~~
~~5~~	~~DX-DOAS equipment~~	~~Table C403.3.2(12) and Table C403.3.2(13)~~	~~1) DX-DOAS is provided with heat recovery if not required by C403.3.5.1.~~
~~6~~	~~Warm air furnace~~	~~Table C403.3.2(5)~~	~~1) Efficiency: +10%[b]~~

~~7~~	~~Boiler~~	~~Table C403.3.2(6)~~	~~1) Efficiency: +15%[c]; or 2) Boiler replacement is combined with the addition of a heat recovery chiller.~~
~~8~~	~~Boiler and hydronic coils (>80% of coils replaced)~~	~~Table C403.3.2(6)~~	~~NA~~
~~9~~	~~Air handling unit (that is not unitary) with electric resistance heating~~	~~NA~~	~~1) Energy recovery is provided in accordance with Section C403.3.5.1 or C403.7.6 without exception.~~

~~a. Includes like-for-like equipment type replacement or a replacement unit of a different equipment type.~~
~~b. This requirement only applies to direct fired appliances; indirect fired appliances do not need to comply with C403.1.4.~~
~~c. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 15 percent. Hot water boilers with input capacity greater than 2,500,000 Btu/h are deemed to comply with this section when minimum thermal efficiency is 95 percent E_t per the test procedure in 10 CFR Part 431.~~

	Proposed Heating Equipment Type[a]	**Heating Efficiency Table Reference**	**Alternate Compliance Options to Section C403.1.4**
1	Air-Cooled Unitary Heat Pumps	Table C403.3.2(2)	1) Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5.[c] 2) Compliance with C403.1.4, except electric resistance mixed air preheat is permissible[c]
2	Packaged terminal, single-package vertical, and room air-conditioner heat pumps	Table C403.3.2(4)	1) Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 Exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5.
3	Furnaces, duct furnaces, and unit heaters	Table C403.3.2(5)	1) Efficiency: +10%[b]
4	Gas-fired hot water boilers with fewer than 80% of coils replaced	Table C403.3.2(6)	1) Efficiency: +10%[b]
5	Variable refrigerant flow air-to-air and applied heat pumps	Table C403.3.2(9)	No alternate compliance option
6	DX-DOAS equipment	Table C403.3.2(12) and Table C403.3.2(13)	1) DX-DOAS is provided with heat recovery if not required by C403.3.5.1.
7	Water-source heat pumps	Table C403.3.2(14)	No alternate compliance option

a. ~~Includes like-for-like equipment type replacement or a replacement of one equipment type with a different proposed equipment type~~ Includes replacement of equipment with a unit that is the same type or higher efficiency and the same or lower capacity, or a replacement of one equipment type with a different equipment type.
b. Equipment shall have a capacity-weighted average heating system efficiency that is 10 percent better than that shown in the reference table (1.10 x values in reference table).
c. Option 1 and Option 2 can be combined.

C503.4.6.1 Hydronic System Alteration Supply Water Temperature. ~~Any~~ Hydronic heating coils ~~or~~and appliances subject to C503.4.5 or C503.4.6 shall comply with C403.3.7.2 [note to reviewer: to be coordinated with proposal number 21-GP1-52].

Exception: Replacement coils within an existing hot water heating system.

~~C503.4.7 Cooling~~ Mechanical ~~equipment relocation.~~ ~~Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.~~

Purpose of code change:

Heat pump space heating eliminates a significant source of fossil fuel combustion in buildings, and is generally 2-4x more energy efficient than either fossil fuel or electric resistance heating. This proposal aligns with State policy to increase energy efficiency by 70% by 2031. Additionally, this proposal will significantly reduce emissions and is aligned with State policy to achieve the broader goal of building zero fossil-fuel greenhouse gas emission homes and buildings by the year 2031. According to analysis done using data from the 2021 Washington State Energy Strategy, we need to reduce the commercial buildings sector emissions by 38% to keep on track to meet our 2050 climate goals. To achieve this, the State will need to quadruple the proportion of annual sales of heat pumps from 11% of all commercial space heating equipment in 2020 to 40% by 2030. To get to this increase in market penetration of heat pumps, the Washington State Energy Code should require heat pump space heating in the 2021 code cycle. See Supplemental Attachment for further details on emissions and market penetration.

Your amendment must meet one of the following criteria. Select at least one:

☐Addresses a critical life/safety need.

☐ The amendment clarifies the intent or application of the code.

☒Addresses a specific state policy or statute.
(Note that energy conservation is a state policy)

☐Consistency with state or federal regulations.

☐Addresses a unique character of the state.

☐Corrects errors and omissions.

Check the building types that would be impacted by your code change:

☐Single family/duplex/townhome	☒Multi-family 4 + stories	☒Institutional
☐Multi-family 1 – 3 stories	☒Commercial / Retail	☒Industrial

Your name	Jonny Kocher	Email address	jkocher@rmi.org
Your organization	RMI	Phone number	619-459-4267
Other contact name	Denise Grab; dgrab@rmi.org		

Instructions: Send this form as an email attachment, along with any other documentation available, to: sbcc@des.wa.gov. For further information, call the State Building Code Council at 360-407-9278.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

Construction costs for heat pump space heating are often, but not always, higher than for conventional natural gas or electric resistance heating. Annual energy costs for heat pumps are much lower than for electric resistance heating, but the same or slightly higher when compared with gas heating, at current rates (World Bank long term forecasts indicate an increase of over 80% in gas prices over the coming decade.) When including the Washington State social cost of carbon, heat pump space heating is more cost effective than both gas heating and electric resistance heating over the life cycle analysis horizon.

Benefits to building owners, tenants, and businesses include early alignment with HB1257 (to avoid future performance compliance penalties) and reduced life cycle cost (especially when considering the potential increases to the Social Cost of Carbon). Given the state's climate goals and policy, this Energy Code proposal will help ensure new assets permitted beginning July 1, 2023 will not need to be immediately retrofitted.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

The average net present value capital cost increase for this proposal will be around $0.24/square foot. The average life cycle cost savings of $0.70/square foot and $2.70/square foot when including the social cost of carbon. See "WA Code Change -Heat Pump Space Heating Proposal - Cost Analysis Supplemental" for more details.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

The average energy savings for this proposal will be around 9.1 KBTU/ square foot. See "Heat Pump Space Heating Supplemental Cost & Energy Data" for more details on the data.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

No increase in plan review or inspection time.

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.